Remarks

The amended claims

Claims 1 and 25 have been amended to more clearly define the "field whose value is a representation of the set". As amended, the "representation specifies individual members of the set". Examples of set representations which have this property are shown at 305 and 307 in Applicants' FIG. 3 and discussed at page 6, line 23-page 8, line 14. The claims are thus fully supported by the Specification as filed. Claims 3 and 27 have been amended to conform to the amendments in claims 1 and 25.

Patentability of the claims over Bakalash

A claim may be rejected under 35 U.S.C. 102 only if the reference used to make the rejection discloses every limitation of the claim under rejection. See MPEP 2131. The independent claims are claims 1 and 23; a feature of both amended claims which distinguishes them from Bakalash is the claims' "aggregated entry" which includes "a field whose value is a representation of a set, the representation specifying individual members of the set" and in which the individual members of the set are "deriv[ed] from values contained in entries belonging to the plurality thereof".

Bakalash's failure to disclose an "aggregated entry" with a "a field whose value is a representation of a set, the representation specifying individual members of the set"

In her Advisory Action, Examiner indicates that Applicants' "aggregated entry" is disclosed in Bakalash at paragraphs [0055]-[0057] and [0073]-[0074].

<u>The disclosure of Bakalash</u>

Bakalash's paragraphs 0024-0026 and FIGs. 1B, 2, and 3 give an overview of Bakalash's disclosure. As described in paragraph 0025, FIG. 1B shows a multi-dimensional database (MDDB) into which base data is loaded by a base data loader. In the MDDB, the aggregation program from an Access, Aggregation, and Retrieval module builds up layers of aggregated data on top of the base data. The aggregated data is organized according to a number of dimensions.

FIG. 2B shows a three-dimensional MDDB in which each record in the MDDB has two fields: a dollar field indicating the purchase price and a units field indicating the number of units of a product purchased for the price. The dimensions in the MDDB are geography, products, and periods of time. The MDDB will return a record specifying dollars and units for each possible combination of geography, products, and time. For example, if the product is a widget and 25

widgets were sold on July 20, 2005 in Cincinnati for $4.00 apiece at a total price of $100.00, the MDDB will return a record having the field values $100, 25 when {widget, July 20, 2000, Cincinnati} is specified to the MDDB. If 100 widgets were sold in all of Ohio the day of July 20, 2005, the MDDB will return a record having the field values $400, 100 when {widget, July 20, 2005, Ohio} is specified. If 800 widgets were sold in all of Ohio the week of July 20, 2000, the MDDB will return the field values $3200, 800) when {widget, week containing July 20, 2005, Ohio} is specified. As is apparent from the foregoing, the base data is aggregated along the various geography, time, and product dimensions of the MDDB. To speed up operation of the MDDB, after the base data has been loaded into the MDDB, the aggregation module pre-aggregates the data. None of the aggregation entries, however, contains "a field whose value is a representation of a set, the representation specifying individual members of the set", as required by amended claim 1.

FIGs. 9(A-C2) and 10A and the description of these figures at paragraphs 0140-0144 disclose the technique of segmented aggregation which is used in Bakalash's system to aggregate data. FIG. 10A discloses how sparse aggregated data is indexed along dimension lines. Again, there is simply no disclosure here of "a field whose value is a representation of a set, the representation specifying individual members of the set". Moreover, a Lexis search of the use of the term "set" in the reference discloses many uses of the term, but no use in the mathematical sense of the term "set". It is of course that sense in which the term is used in Applicants' Specification and in claim 1.

The locations cited by Examiner

[0055]-[0057] are part of a description of relational OLAP (ROLAP) and multidimensional OLAP (MOLAP) systems from the *Brief description of the state of the art* portion of Bakalash's Specification. The only part of the ROLAP description that appears to be relevant is a statement in [0055] that "if required by the data model, database routines are run to pre-aggregate the data within the RDBMS". [0056] and [0057] contain the MOLAP description. The only part of that description that appears to be relevant is the following from [0056]:

> As shown in FIG. 15, such MOLAP systems have an aggregation engine which is responsible for all data storage, access, and retrieval processes, including data aggregation (i.e. pre-aggregation) in the MDDB,

[0073]- [0074] are part of a general discussion of aggregation in the *Brief description of the state of the art*:

> [0073] One of the most fundamental principles of the multidimensional database is the idea of aggregation. The most common aggregation is called a roll-up aggregation. This type is relatively easy to compute: e.g. taking daily sales totals and rolling them up into a monthly sales table. The more difficult are analytical calculations, the aggregation of Boolean and comparative operators. However these are also considered as a subset of aggregation.
>
> [0074] In a star schema, the results of aggregation are summary tables. Typically, summary tables are generated by database administrators who attempt to anticipate the data aggregations that the users will request, and then pre-build such tables. In such systems, when processing a user-generated query that involves aggregation operations, the pre-built aggregated data that matches the query is retrieved from the summary tables (if such data exists). FIGS. 18A and 18B illustrate a multi-dimensional relational database using a star schema and summary tables. In this example, the summary tables are generated over the "time" dimension storing aggregated data for "month", "quarter" and "year" time periods as shown in FIG. 18B. Summary tables are in essence additional fact tables, of higher levels. They are attached to the basic fact table creating a snowflake extension of the star schema. There are hierarchies among summary tables because users at different levels of management require different levels of summarization. Choosing the level of aggregation is accomplished via the "drill-down" feature.

None of the cited locations discloses anything about aggregation beyond what is discussed in pages 1-4 of Applicants' *Description of related art.* There is no disclosure whatever of the claimed "aggregated entry" which includes "a field whose value is a representation of a set, the representation specifying individual members of the set" and in which the "the individual members specified in the representation of the set [are derived from] from values contained in entries belonging to the plurality thereof". The lack of any such feature in Bakalash is confirmed by the comment in [0074] that "there are hierarchies among summary tables because users at different levels of management require different levels of summarization" and also the comment at [0077] that "summary tables do not provide a mechanism that allows efficient drill down to view the raw data that makes up the summary table--typically a table scan of one or more large tables is required". Applicants' claimed "aggregated entry" which includes "a field whose value is a representation of a set that is capable of having a plurality of members" preserves the raw data in the summary tables and thus reduces the depth of the hierarchy. The claimed "aggregated entry" also makes it easier to drill down to view the raw data. In the system management context in which a preferred embodiment of Applicants' invention is employed, the claimed "aggregated entry" further makes it possible to delete the table entries that originally contained the raw data without losing the raw data.

It should further be pointed out here that because Bakalash does not disclose an aggregated entry of the kind required by the claim, Bakalash also cannot disclose the step of " deriving the individual members specified in the representation of the set from values contained in entries belonging to the plurality thereof ".

Patentability of claims 1 and 25 over Bakalash

Because Bakalash does not disclose either Applicants' limitation of "a field whose value is a representation of a set, the representation specifying individual members of the set" or the limitation in the last method step that the "individual members specified in the representation of the set [are derived] from values contained in entries belonging to the plurality thereof," claims 1 and claim 25 as amended are not anticipated by Bakalash. Further because the remaining claims are all dependent either from patentable claim 1 or patentable claim 25, they are also patentable.

Patentability of the dependent claims in their own rights

Additionally, the dependent claims set forth limitations which are not disclosed in Bakalash, and are consequently patentable in their own rights over the references. Beginning with claims 2 and 26, the added limitation is that "the plurality of entries represented by the aggregated entry [are deleted]" from their table of origin. In her rejection, Examiner refers Applicants to paragraphs [0216] and [0258]. [0216] refers to items of a "work list" that are deleted after they are processed. [0214] makes it clear that the items on the work list are copies of items on an ordered list of items; the deletion of an item on the work list thus has no effect on the ordered list of items or on the actual sources of the ordered list. [0258] discusses FIG. 22, which discloses an embodiment in which an RDBMS is a component of a data warehouse system. There is absolutely nothing in [0258] concerning deletion of data from tables. Thus, neither [0216] nor [0258] discloses the added limitation and claims 2 and 26 are patentable in their own rights over the references.

Claims 3-6 and 27-30 set forth further limitations concerning claim 1 and claim 26's limitation of the "representation specifying individual members of the set"; since Bakalash does not disclose any such representation, the reference cannot disclose the further limitations of the representation and these claims as well are patentable in their own rights over the reference.

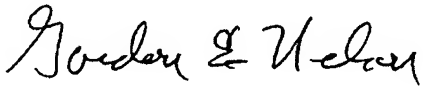
Claims 7-8 and 31-32 set forth further limitations concerning the step of "deriving the individual members specified in the representation of the set from values contained in entries belonging to

the plurality thereof". Because Bakalash does not disclose that step, the reference necessarily cannot disclose these further limitations, and these claims as well are patentable in their own rights over the reference.

Conclusion

Applicants have amended their claims to better distinguish them from Bakalash, have demonstrated that the claims as amended are fully supported by the Specification as filed, and have further demonstrated that the claims as amended are not anticipated by Bakalash. Applicants have thereby satisfied the requirements of 37 C.F.R. 1.111(b) and respectfully request that Examiner enter the amendment and continue with her examination as provided by 37 C.F.R. 1.111(a). A petition for a one-month extension of time and the requisite fee accompany this response. No fees are believed to be required by way of this response; if any should be, please charge them to deposit account number 501315.

Respectfully submitted,



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